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APPLIED MATERIALS, INC.
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SANTA CLARA, CA 95050

[REDACTED] EXAMINER

OJESSEN, ALLAN W.

[REDACTED] REC'D. [REDACTED]

DATE MAILED: APR 18 1991

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/507,629

Applicant(s)

SHEN ET AL.

Examiner

Art Unit

Alain W. Osen

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.13(a). In the event, however, a reply is timely filed after SIX (6) MONTHS from the mailing date of this communication, the reply may be considered timely if it is filed within the period for reply specified above. The maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication. If no period for reply is specified above, the maximum statutory period will apply and will expire THREE (3) MONTHS from the mailing date of this communication. In no event, however, may a reply be filed more than three months after the mailing date of this communication, even if the reply is filed in a year or less than a year from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will result in the application becoming ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 29 July 2002
- 2a) This action is **FINAL**. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-5,7-15,17-21 and 32-71 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) 1-5,7-15,17-21 and 32-43 is/are allowed.
- 6) Claim(s) 44-50,53,54,56,59,60,62-65 and 67 is/are rejected.
- Claim(s) 51,52,57,58,61,63,64,66,68-71 is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) The proposed drawing correction filed on _____ is: a) approved b) disapproved by the Examiner.
If approved, corrected drawings are required in reply to this Office action.
- 12) The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) All b) Some * c) None of:
1. Certified copies of the priority documents have been received.
2. Certified copies of the priority documents have been received in Application No. _____.
3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
* Please see [http://www.uspto.gov/patent/OfficeAction](#) for a list of the certified copies not received.
- 14) Acknowledgment is made of a claim for domestic priority.
- a) The translation of the foreign language provisional application has been received
- 15) Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- Request for Reconsideration (37 CFR 1.82(e))
 Response to an Office Action Under Title 35, United States Patent and Trademark Office Rules and Regulations
 Information Disclosure Statement (37 CFR 1.144(e); Paperless Filing)

- Continuation, Divisional, or Continuation-in-Part Application
 Response to an Office Action Under Title 35, United States Patent and Trademark Office Rules and Regulations
 Information Disclosure Statement (37 CFR 1.144(e); Paperless Filing)

DETAILED ACTION

The papers filed on 4/23/02 and 7/29/02 (certificates of mailing dated 4/10/02 and 7/24/02 respectively) have not been made part of the permanent records of the United States Patent and Trademark Office (Office) for this application (37 CFR 1.52(a)) because of damage from the United States Postal Service irradiation process. The above-identified papers, however, were not so damaged as to preclude the USPTO from making a legible copy of such papers. Therefore, the Office has made a copy of these papers, substituted them for the originals in the file, and stamped that copy:

COPY OF PAPERS ORIGINALLY FILED

If applicant wants to review the accuracy of the Office's copy of such papers, applicant may either inspect the application (37 CFR 1.14(d)) or may request a copy of the Office's records of such papers (*i.e.*, a copy of the copy made by the Office) from the Office of Public Records for the fee specified in 37 CFR 1.19(b)(4). Please do **not** call the Technology Center's Customer Service Center to inquiry about the completeness or accuracy of Office's copy of the above-identified papers, as the Technology Center's Customer Service Center will **not** be able to provide this service.

If applicant does not consider the Office's copy of such papers to be accurate, applicant must provide a copy of the above-identified papers (except for any U.S. or foreign patent documents submitted with the above-identified papers) with a statement that such copy is a complete and accurate copy of the originally submitted documents. If applicant provides such a copy of the above-identified papers and statement within **THREE MONTHS** of the mail date of this Office action, the Office will add the original mailroom date and use the copy provided by applicant as the permanent Office record of the above-identified papers in place of the copy made by the Office. Otherwise, the Office's copy will be used as the permanent Office record of the above-identified papers (*i.e.*, the Office will use the copy of the above-identified papers made by the Office for examination and all other purposes). This three-month period is not extendable.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 44-49 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,605,601 issued to Kawasaki.

Kawasaki teaches a method in which dissimilar silicon containing regions of a substrate are etched at approximately the same rate, as indicated by an etching selectivity of approximately 1 for silicon dioxide relative to polysilicon (column 7, lines 33-42). Kawasaki's method uses a plasma comprising Cl₂ and NF₃ with the NF₃ comprising up to 70% of the total mixture (column 3, lines 2-5). One function of the NF₃ component is to provide fluorine, an active etching agent. A second function is to provide nitrogen, which contributes to sidewall passivation (column 3, lines 1-2). Kawasaki teaches a second etching step that includes HBr (column 3, lines 21-26). Kawasaki does not explicitly teach that the etching rates of the dissimilar silicon containing materials are within about 5 % of each other. However, because Kawasaki meets all of the other process limitations, the claimed result is considered to be an inherent outcome of Kawasaki.

Claims 50, 53, 54, 56, 59, 60, 62 and 65 are rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,248,252 issued to Nguyen et al. (hereinafter, Nguyen) Nguyen teaches etching with a RF coupled plasma comprising Cl₂, N₂ and CF₄. Nguyen teaches a Cl₂ flow rate of 19-35 sccm, a CF₄ flow rate of 3-6 sccm and an N₂ flow rate of 13-24 sccm. See abstract and column 5, lines 30-40.

Claims 50, 53, 54, 56, 59, 60 62 and 65 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent 5,609,775 issued to Liu.

Liu teaches etching with a RF coupled plasma comprising Cl₂, N₂ and CF₄. Liu teaches a Cl₂ flow rate of 20 sccm, a CF₄ flow rate of 30 sccm and an N₂ flow rate of 10 sccm. See column 4, lines 34-37.

Claim 67 is rejected under 35 U.S.C. 102(e) as being anticipated by US Patent 6,083,841 issued to Yano et al. (hereinafter, Yano).

Yano teaches etching with a plasma generated from a gas mixture consisting of CF₄, Cl₂ and N₂. See column 4, lines 28-31.

Allowable Subject Matter

Claims 1-5, 7-15, 17-21, 32-43 are allowed.

Claims 51, 52, 55, 57, 58, 61, 63, 64, 66 and 68-71 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Allan Olsen whose telephone number is 703-306-9075. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Greg Mills, can be reached on 703-308-1633.

The general fax numbers for TC1700 are 703-872-9310 (non-after finals) and 703-872-9311(after-final).

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the Group receptionist whose telephone number is (703) 308-0661.

Allan Olsen, Ph.D.
December 2, 2002

Allan Olsen